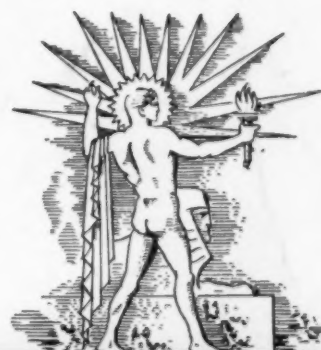


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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE •



January 13, 1940

Fabric Bearing

See Page 22

A SCIENCE SERVICE PUBLICATION

Do You Know?

Helmets worn by British "Tommies" are made of non-magnetic manganese steel.

When plants give off quantities of water through their leaves, they avoid sunburn.

Germany has been forced to over-cut its forests seriously, in using wood in substitutes and for other emergencies.

China and Mongolia, a little larger than the United States, have less than 9,000 miles of railroad, compared with 253,000 in the United States.

Catalina Island, off the California coast, may be 30 million years older than nearby islands, is the theory of oceanographers based on a geological study.

The tiny tungsten filament of an incandescent lamp gives off light at the highest temperature ordinarily encountered by man, or twice the temperature of molten steel.

Government scientists find that southern peach trees, which require ordinarily a certain amount of winter cold before breaking their winter rest, will bud successfully after milder winters if sprayed with a dinitrophenol compound.

Dry ice was originally produced from carbon dioxide especially manufactured for the purpose, says *Industrial and Engineering Chemistry*; but now 85% of the dry ice in America is made from carbon dioxide that is a by-product from fermentation and other industries.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

Archaeology

How did an Egyptian queen of 5,000 years ago put away her curtains? p. 19.

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Chrysanthemums hardy enough to stand winters in Michigan, Wyoming, and upper New York State have been developed.

Chungking, present capital of nationalistic China, has had its name since 1188 A.D. but there was a settlement on the site as far back as 2200 B.C.

The only apple trees in America before white men came were the crab-apples.

Crater Lake, Oregon, is sometimes called "bottomless," but the bottom of Crater Lake has been more accurately mapped than the surface of many townships of the state.

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PUBLIC HEALTH—PSYCHIATRY

Neuropsychiatric Institute Proposed By Surgeon General

**Modeled After National Cancer Institute, New Staff
Would Attack Problem of Mental and Nervous Diseases**

MENTAL and nervous diseases which doom their victims to a life from which death is a welcome release are scheduled for attack on a nationwide scale by the plans of the nation's leader in the fight for health, Surgeon General Thomas Parran of the U. S. Public Health Service.

Spearhead of the attack would be the National Neuropsychiatric Institute which Surgeon General Parran proposed in his annual report transmitted to Congress.

This Neuropsychiatric Institute would be modeled after the National Cancer Institute, where a staff of trained scientists are now searching for knowledge leading to methods of controlling cancer.

Mental and nervous diseases and epilepsy together represent the largest unsolved problem in medicine, Surgeon General Parran stated in his report recommending that the nation build a National Neuropsychiatric Institute.

Hospitals caring for mental disease have on their books more than 500,000 patients and more than 117,000 additional patients are in hospitals for mental defectives and epileptics. The aging of our population will tremendously increase the total number of sufferers from mental disease.

"By 1980 it is predicted that we shall have one-half the people under 19 years of age we now have, and twice as many over the age of 65," Surgeon General Parran pointed out.

Prevention Urged

"The incidence of mental disease in the age group over 65 years is 10 times what it is in the group of 19 years and under. A little mathematics will show how much more mental disease we shall have then than now. We must start now," he declared, "to work out methods for preventing mental disease to help avoid such a load in the future."

"Recent developments showing the influence of certain vitamins, such as nicotinic acid, in relieving cases of insanity not heretofore recognized as being of dietary origin open many possibilities for

further research not only of accessory food factors but of other phases of body metabolism, such as hormones.

"The impression is growing among psychiatrists that constitutional and metabolic factors may play a role in forms of insanity heretofore thought of as being of psychic origin," he continued.

The effects of insulin shock treatment now used in one form of mental disease, schizophrenia, which are like "taking the veil from the patient's eyes, transporting him from a vegetative state to an apparently normal one for a time," cause a great disturbance of body metabolism, he pointed out. All these factors indicate the need for physiological research on mental and nervous disorders.

The proposed Neuropsychiatric Institute would be built on the present site

of the New York Marine Hospital, giving the staff access to patients and to the library facilities of the metropolis, and the advantages of working under the "stimulating influence of extensive activities and informed personnel in the nervous and mental disease field." The plans call for 350,000 cubic feet of laboratory space for fundamental research and access to 200 patients for clinical study. It is also suggested that the Institute should have funds to allot to competent groups throughout the country for research on the problem of nervous and mental disease and epilepsy, and that a national advisory council, similar to the National Advisory Cancer Council, should be established.

Warmly Approved

The idea for the Neuropsychiatric Institute has been warmly approved by authorities in the field, it is stated. Although millions of dollars are being spent each year for the care and treatment of the mentally sick, very little is being spent for fundamental research which might lead to a measurable control of such sickness through discoveries pointing to effective measures of prevention and cure.

Science News Letter, January 13, 1940



FOR HOUSEKEEPING

In a workshop at the Pyramids of Giza, Haggi Ahmed Yusef of the Cairo Museum is shown restoring a beautiful box that Pharaoh Cheops' mother, Queen Hetep-heres, had for keeping curtains. Found in almost hopeless chaos in her secret tomb at Giza, the faience inlay on gold has been patiently reset on a new box of proper size. A replica of this 5,000-year-old piece of furniture has been received by the Museum of Fine Arts, Boston, which explored the queen's tomb in a joint expedition with Harvard University.

MEDICINE

Synthetic Chemical Vaccines Against Pneumonia Announced

Rabbits and Mice Are Protected Against Type II
By Artificial Antigens Built in Laboratory

ANTI-PNEUMONIA vaccines of sugars and acids made in the chemist's laboratory instead of in the pneumonia germ's body were announced by Dr. Walther F. Goebel, of the Hospital of the Rockefeller Institute for Medical Research, New York City, at the meeting of the Society of American Bacteriologists in New Haven.

Rabbits and mice were protected against Type II pneumonia by these artificial antigens, as Dr. Goebel terms them. No human trials were reported.

A sort of chemical dissection of the pneumonia germ was the starting point for production of the artificial antigens that give resistance or immunity to the disease. The specific polysaccharide or complex sugar of the Type III pneumonia germ was taken apart and one of its building stones used to make an antigen which, when injected into rabbits, called up pneumonia-fighting antibodies. Rabbits' blood containing these antibodies also protected mice against Types II, III, and VIII pneumonia germs.

A second antigen was prepared synthetically. This synthetic antigen differs from the natural one only in the chemical structure or architecture of one group of substances, the aldobionic acids, present in both. This single difference, however, is sufficient to make the natural and synthetic antigens very different for pneumonia vaccination purposes. For example, the synthetic one can protect mice against very large doses of virulent Type II pneumonia germs, but not against Types III and VIII germs.

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Influenza Vaccination

RESULTS of influenza vaccination on more than a thousand human subjects with a vaccine of living influenza virus made in the laboratories of the New York City Department of Health were announced for the first time at the meeting.

The influenza-preventing value of the vaccine could not be conclusively determined from this trial, Drs. Morris Siegel and Ralph S. Muckenfuss, of the New

York City Department of Health, reported.

One difficulty in evaluating the vaccine on its first trial was that it was given during the 1939 epidemic. Influenza virus, however, was probably not responsible for all the illness during this epidemic. The patients had symptoms of influenza, but the germ that made them sick was not the same as the virus usually considered the cause of influenza and used in making anti-influenza vaccine.

Blood tests of the vaccinated people, however, showed that their blood contained influenza-fighting antibodies for four or five months after vaccination with influenza virus vaccine. Mouse tests also showed that the vaccine had anti-influenza potency.

Further human trials of the vaccine are planned. The first trials were made at Letchworth Village, New York State institution for mental defectives at Thiells, N. Y. Of the 3,600 inhabitants, one-third were given the influenza vaccine.

Science News Letter, January 13, 1940

Sulfanilamide In Oil

SULFANILAMIDE and related chemical remedies for streptococcus and other germ diseases are more effective when given in oil than when given, as is usually done, in water or gum arabic, Dr. W. Harry Feinstone of the American Cyanamid Company reported.

The chemicals are absorbed more readily when given in oil, he found, and the concentration in the patient's blood remains at a curative level for longer periods.

New chemical derivatives of sulfanilamide, more active in mouse streptococcus infections than sulfanilamide, and capable of acting directly on the germs without first having to be broken down chemically in the body, were announced by Dr. Feinstone. These new chemicals, he said, were made by Drs. M. L. Crossley, E. H. Northey and M. E. Hultquist, of the Calco division of the American Cyanamid Company.

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STEEL COIN

Stainless steel gets new usage in Italy as her mints pour out an entire issue of coins made of a steel containing approximately 22% chromium, 12% nickel and a small amount of molybdenum. Smallest among the coins is about the size of our nickel, the largest slightly larger than our half dollar. The total issue will use about sixteen and one-half million pounds of stainless steel. Italians are becoming accustomed to have stainless steel substitutes for noble metals; about three years ago patriotic Italian women sacrificed gold wedding rings as a patriotic gesture. The government replaced them with bands of stainless steel.

MEDICINE

Federal Health Service Has New Vaccine

A NEW vaccine for protection against a new and possibly widespread feverish ailment spread by ticks is ready for its first trials on human volunteers, the U. S. Public Health Service announces.

The new vaccine, successful in guinea pig trials, was prepared by Dr. Herald E. Cox and E. John Bell, of the Rocky Mountain Laboratory of the National Institute of Health at Hamilton, Mont. It was made from germs from infected ticks and also from the same kind of germs grown on developing chick eggs.

A member of the Washington headquarters staff of the National Institute of Health was the first recognized human case of the new disease, which has been named *Rickettsia diaporica*. He contracted the disease while observing research on it during a visit to the Hamilton laboratories, and recovered after about one month's illness characterized by mild fever with chills, recurrent sweating and tender finger joints.

The ease with which the infection was picked up in the laboratory plus the fact that the infection occurs naturally in ticks suggests that there may have been other human cases. The disease is very similar to if not the same as the "Q" fever of Australia. The fact that

two such similar diseases exist at points so geographically far apart leads health authorities to believe that other cases must be occurring in both countries and probably in many countries between here and Australia.

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DENTISTRY

Tooth Decay Remedy Made By Sulfanilamide Discoverer

"Zephiran" May Prevent Caries by Stopping Production Of Lactic Acid; Is Powerful Germ Killer and Cleanser

A CHEMICAL weapon against tooth decay that may prove as effective as sulfanilamide is against streptococcus infections was announced by Drs. Benjamin F. Miller, Sigmund Bradel and John A. Muntz, of the Zoller Memorial Dental Clinic of the University of Chicago, in a paper presented before the meeting of the American Association for the Advancement of Science in Columbus.

The new anti-caries chemical, called Zephiran, was made by the man who gave sulfanilamide to the world and who was awarded the 1939 Nobel Prize for this achievement, Prof. Gerhard Domagk, of the I. G. Farbenindustrie in Germany.

Long-term studies of Zephiran on patients suffering from dental caries are now under way, following the promising results of laboratory experiments with it, the Chicago scientists stated.

When it was swabbed on the teeth of patients in preliminary trials, it stopped lactic acid production after two minutes of swabbing, and prevented any increase in general acidity. Since lactic acid in high concentration can destroy tooth enamel and thus give decay a chance to start, Zephiran promises to be a potent weapon against tooth decay.

Zephiran was tried after the Chicago scientists had found that two other chemicals, sodium fluoride and iodoacetate, markedly reduced the amount of experimental caries or tooth decay in rats. These two chemicals, it was believed, checked decay by interfering with enzyme processes involved in the growth or metabolism of bacteria associated with the decay process. Fluorine in drinking water, cause of the ugly mottled enamel condition of teeth, had previously been found by other investigators to play a role in caries prevention.

Search for a better and less poisonous

substance than sodium fluoride or iodoacetate to use on human patients led to the trials of Zephiran. This substance is, in chemical terms, alkyl dimethyl benzyl ammonium chloride. It is a powerful germ-killer. In addition, it acts as a cleansing agent, is relatively harmless to mucous membranes such as line the inside of the mouth, and it lowers the surface tension of water. This last property is important because it means the chemical is a good wetting and penetrating agent and can get into effective contact with the dense mass of germs in the dental plaque. Dental plaques are deposits on the teeth of material supposed to act as a medium for the lodgment of germs associated with the decay process.

Zephiran-swabbed and unswabbed plaques were removed from patients' mouths and studied in the preliminary trials. It was in these trials that the inhibition of lactic acid formation was discovered.

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Diabetics Miss Toothaches

DIABETIC children in general are spared the nagging pain of toothaches and the discomfort of having cavities in their teeth filled, it appears from a report by Dr. George Stein, of the Harvard Dental School.

A group of 82 patients who had acquired diabetes during childhood gave Dr. Stein the information he reported. Examination of these patients showed that caries, or tooth decay, was infrequent. If there was a marked susceptibility to caries at the onset of the diabetes, the progress of the caries and acquisition of new caries was slowed.

Difference in nutrition seems not to be the only reason for the low suscepti-

bility to caries, as all the patients Dr. Stein examined are on a normal mixed diet. Changes in the composition of the saliva and other factors seem to play a part, he said.

Pyorrhea and other diseases of the gums, on the other hand, do afflict diabetics, particularly as they grow older. Pyorrhea was not found affecting the temporary or "baby teeth," but one-fourth of the patients over 18 years of age had pyorrhea or other diseases of gums and tooth sockets, and three of these patients had lost all their teeth by loosening.

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POPULATION

Population Trend Alarming To Statistical Expert

ALARM over the trend toward lower birthrates was expressed by Prof. Raymond Pearl of the Johns Hopkins University in his presidential address before the American Statistical Association in Philadelphia in which he said people in the prime of life are contriving to throw off some of the burden of supporting young and old by having fewer children.

"Just possibly what mankind is slowly and steadily doing," Prof. Pearl warned, "may turn out in the long run to be the moral equivalent of curing a toothache by the effective but disastrous technique of cutting off the patient's head. There is no good in making life easier if there is not going to be anybody around to live it."

The world's population, he said, increased nearly five-fold in the three centuries between roughly 1630 and 1930. This brought about present efforts to lessen crowding and discomfort, which now are showing results in lowered birthrate and increasing numbers of the old.

Analysing the United States' biggest population problems, and citing "such weird economic philosophies" as those currently associated with "ham and eggs" or "\$200 a month," Prof. Pearl said:

"It is plain that the old folks, on the one hand, and the youngsters, on the other hand, by their own lusty bellowings and the supplementary skullduggery of their 'humanitarian' friends are ganging up, as the expressive phrase goes, on the half of the population that does the work, pays the bills and taxes, and in cold fact earns the livings for all."

Counting both young and old, the burden borne by the harassed section of the population between 15 and 50 years old, is actually not so great as it was a cen-

tury ago, Prof. Pearl finds. In 1840 for every 1,000 persons of these ages there were 1,084 younger or older to be taken care of; in 1930, for each 1,000 of the "reproducer-worker phase of life" there were only 880 persons besides themselves to be cared for.

PUBLIC HEALTH

"Grapes of Wrath" Migrants Get Help Through Association

MEDICAL help for the acute health problems of the "Grapes of Wrath" migrant agricultural workers in California and Arizona is being given as fast and far as possible by the Agricultural Workers Health and Medical Association, it appears from a report to the American Medical Association by its bureau of medical economics chief, Dr. R. G. Leland.

Nearly 38,000 migrant workers and their families have already been given medical, dental, hospital and other health care by this mutual benefit association, organized in May, 1938. Doctors, dentists, druggists and hospitals of California and Arizona, the Farm Security Administration, the California State Department of Public Health and the U. S. Public Health Service have cooperated in planning and carrying out the program. The Association is empowered to borrow money for paying doctors' and other bills and purchasing supplies, from the Farm Security Agency or other federal or state agencies. For the first year of operation \$952,597.97 was spent.

To instill into the minds and consciences of the mass of our people that their chief concern is the composition of the population may, Prof. Pearl said, be the principal duty of the American Statistical Association in years ahead,

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Headquarters of the Association are at Fresno, Calif., with regional offices in Arizona and as far north as Willows, Marysville and Santa Rosa, Calif. The personnel of these regional offices has followed the crops, in the wake of the migrant army, in order to be near at hand to serve it. At first member patients were referred to doctors' and dentists' offices in the vicinity, but now most of them are served in clinics staffed by doctors chosen by the county medical societies.

Influenza, pneumonia and other respiratory diseases and digestive diseases ranked high in numbers of member patients treated. Malnutrition and dietary deficiencies were fairly prominent among children. Babies were delivered, broken bones were set, infections, injuries and dental troubles were cared for. Services are primarily for acute sickness or injury, but when a chronic illness threatens the welfare of the entire family by laying up its breadwinner or the mother, such illness is treated.

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the theory that the structure of the Atlantic and Pacific basins may be more similar than heretofore supposed.

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Quakes Come in Groups

THE earthquakes that wrought worse havoc than war in Turkey were third in a series of four severe disturbances that occurred in widely separated parts of the earth in less than a week. Five days before, there were two quakes centering off the Pacific shore of Costa Rica and one in the northern part of the island of Celebes; five days afterwards a sharp shock was felt in southern California.

It is not uncommon for earthquakes to come in groups like this, with intervening periods of relative quiet. Why they should do this is one of the things that still puzzles scientists.

It is possible that one earthquake can set off another, even in a remote part of the earth, seismologists of the U. S. Coast and Geodetic Survey stated. This could happen, however, only when the second locality was "all set" for an earthquake that would occur later on anyway. If the rocks of the earth's crust were in the state of severe strain that precedes an earthquake and is relieved by it, even a slight additional push, such as might be provided by waves traveling through the earth's core, might act in the capacity of the proverbial last straw and precipitate the break.

Other "triggering forces" that have been invoked as possibilities include the tidal pull of sun and moon and the occurrence of large changes in barometric pressure over the affected area.

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SEISMOLOGY

Earthquake Gives Scientists Hint of Earth Structure

THE SEVERE earthquake in Turkey which destroyed thousands of lives and caused great property damage on the day after Christmas has provided American seismologists with new scientific evidence as to the nature of the layers of rock underlying the Atlantic Ocean.

Scientists at the University of Vermont have reported to the U. S. Coast and Geodetic Survey that besides the large surface waves, expected in any violent earthquake, their instruments detected a high speed type of surface wave which

is ordinarily observed only in earthquake shocks which reach the United States over pathways under the Pacific Ocean where there is little overburden or continental structure.

The arrival of this type of wave for the Turkey quake is taken to indicate an unusual disturbance in the deep basaltic rock of the earthquake area, say Coast and Geodetic Survey scientists.

The character and speed of the normal surface waves at the University of Vermont station also give added evidence to

ENGINEERING—CHEMISTRY

Steel Mills Are Run On Fabric Bearings

See Front Cover

CLOTH saturated with a synthetic resin and baked and squeezed under pressures up to 6,000 pounds per square inch formed the bearing for the roll neck of a steel mill stand shown on the front cover of this week's SCIENCE NEWS LETTER.

It is said then to be as hard and as strong—pound for pound—as the steel itself. The material is known as Micarta and is made by the Westinghouse Electric and Manufacturing Company.

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An air conditioning system protects rare violins in the Library of Congress.

BIOLOGY

Trichinosis Danger May Be Eliminated by New Inspection

Simple Skin Test Costing Less Than Half Dollar Per Pig Is Accurate to Within Less Than Three Per Cent

A PRACTICAL plan for the eradication of dangerous trichinosis, at a cost of from 25 to 50 cents per pig slaughtered, was presented by Prof. Thurlow C. Nelson, of Rutgers University, before the meeting of the American Association for the Advancement of Science. The plan depends on widespread use of a new, simple skin test for trichinosis developed by Drs. G. W. Bachman, D. L. Augustine and Hans Theiler. It has been used successfully by the New York City Health Department during the past 18 months.

"Every seventh to tenth garbage fed pig slaughtered in this country today is wormy, infected with the most dangerous worm known to man," Prof. Nelson declared.

Humans eating the meat of such animals, unless it is thoroughly cooked, may develop the serious and often fatal malady, trichinosis. Federal health service estimates show that the trichinosis problem involves some 17,000,000 people, several hundred thousand of them suffering the disease, and probably several thousand dying from it every year.

By Prof. Nelson's plan the new skin test would be made of every hog slaughtered, both in commercial packing houses and on farms slaughtering for home and local consumption. The cost of this, once arrangements are made, need not be more than 50 cents per animal, and may be as low as 25 cents. The New York experience with the test shows it is accurate to within less than 3%, and the error is in the direction of safety, since with one exception all the mistakes made were diagnoses of trichina infection where it did not exist.

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Vaccination For Birds

VACCINATION against malaria, in birds, but unfortunately not in man, was announced by Dr. W. B. Redmond, of Emory University, Atlanta, Ga. Whether the method can be applied to human malaria was not stated in Dr. Redmond's report of his work.

The successful vaccine was prepared by killing the malaria parasites or germs in the red blood cells without destroying these cells. This was accomplished by subjecting the cells with the germs in them to subzero temperature in a solution of urea and sodium citrate.

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New Maple Disease

BLEEDING canker, a new plant disease that attacks maple trees, has been found in Rhode Island, Drs. Frank L. Howard and N. Caroselli of the Rhode Island Agricultural Experiment Station reported. The principal symptom is a reddish ooze from small fissures in cankers of the trunk and main branches. Inner bark and sapwood develop a reddish-brown lesion, often with an olive-green margin. Secondary symptoms include wilting of leaves and dieback of branches, produced by a poisonous secretion of the causal fungus. This fungus belongs to the same genus as the one that causes potato blight, one of the worst of crop plagues.

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Salmon Migration Theory

A PHYSICO-CHEMICAL theory of salmon migration was advanced by Prof. Edwin B. Powers of the University of Tennessee. Instead of obeying some mysterious, semi-supernatural "homing instinct," the fish merely swim up the stream that brings them the lowest concentration of carbon dioxide, is Prof. Powers' belief. River waters mixing with sea water lower the concentration of carbon dioxide, and the salmon find the river mouths simply by going toward the lower carbon dioxide concentration waters.

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Plants Poisonous to Pest

THE BRAGGING old cowboy song, that modestly states, "Rattlesnakes came out and bit me, and then crawled

away and died," finds realization for greenhouse plants when they are given two or three parts of the poisonous element selenium per million of the nutrient solution in which they are grown. Such plants are completely freed of the attacks of red spider, one of the worst of greenhouse pests, yet show no ill effects in their own growth, it was stated in a report presented jointly by Drs. V. H. Morris, C. R. Neiswander and J. D. Sayre of the Ohio Agricultural Experiment Station.

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Tear Gas For Tomatoes

DISAGREEABLE as it is to human beings, tear gas (chloropicrin) is very good for tomatoes, when used as a soil fumigant. Tomatoes thrive amazingly in soil that has been thus treated. Drs. Fred K. Crandall and Frank L. Howard of the Rhode Island Agricultural Experiment Station related how tomatoes raised on chloropicrin-treated soil increased their yield by 132% in 1937, by 378% in 1938, and by 246% in 1939, as compared with check plants grown on untreated soil.

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Stored Fruit Loses Vitamin

TANGERINES kept in storage too long lose a considerable part of their value as source of vitamin C (ascorbic acid), Dr. Cyril O. Bratley of the U. S. Department of Agriculture stated. In his experiments, numbers of the fragrant citrus fruits were kept in storage for eight weeks at various temperatures. Loss was greatest at the higher temperatures: one-eighth of the vitamin vanished at 32-33 degrees Fahrenheit, but at 45-48 degrees the loss rose to one-third.

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Clues to Rhythms

IMPORTANT clues to the little understood biological rhythms which induce such animal cycles as sleep, reproductive activity and hibernation have been found in daily color changes in the eyes of crayfish, Dr. John H. Welsh, Harvard Biological Laboratories, reported.

The theory that there is a "sleep center" in the brain which acts as an internal master-clock of human activity is definitely refuted, Dr. Welsh said, by his studies, which were made on crayfish and rats living continuously in dark, soundproof rooms. (Turn to Page 28.)

ASTRONOMY

Three New White Dwarfs Weigh 3 Tons Per Inch

THREE more "white dwarf" stars, heavyweights of the heavens, have been found by Prof. Gerard P. Kuiper of the McDonald Observatory, raising the number known to 25. White dwarf stars are relatively close to earth and some of them weigh a million pounds per cubic inch.

The new white dwarfs are Wolf 1, Ross 548, and the faint star in what astronomers call Selected Area 26. They are all comparatively light weights, with densities of about 3 tons per cubic inch, which still is thousands of times the weight of earthly matter.

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ARCHAEOLOGY

Unearth Greek Home Of "Winged Victory"

EXCAVATING the sanctuary at Samothrace, where the famous "Winged Victory," now in the Louvre, once stood, archaeologists have learned more about mystery rites of ancient Greece.

A large hall was used for the dramatic performances and rites of initiation when new members were added to the religious cult of the Great Gods of Samothrace, Dr. K. Lehmann-Hartleben, of New York University, told the Archaeological Institute of America, meeting at Ann Arbor, Michigan. On two sides of the great hall were rows of wooden benches, possibly for ambassadors who came to the festival from many towns, and on the south side of the hall was a sloping platform for spectators.

Nearly in the center a round wood platform, still discernible in the burnt debris, marks the spot where the new members of the religious community were exhibited to the crowd. In the southeast corner, a round sacrificial structure was for pouring liquids into a pit under the open sky. After initiation, the new members entered a side chamber and a higher level, where they had a final revelation.

Pronouncing the sanctuary building unique in its type and installation, Dr. Lehmann-Hartleben said that it had a long life of about 900 years, since the structure dated from about 500 B.C. and the cult was still active in the fourth century A.D. The interior he described shows its appearance about 300 B.C.

The Victory statue, he said, stood on

a platform framed by terrace walls, and overlooked the romantic valley of the sanctuary.

Great masses of architectural relics, sculptures, coins, and clay wares have made it necessary to start building a museum. The expedition of the Archaeological Research Fund of New York University was carried out under auspices of the American School of Classical Studies in Athens.

Science News Letter, January 13, 1940

GEOLOGY

Radium in Navajo Rugs; Dye Made from Carnotite

CARNOTITE, canary-yellow colored ore of radium, uranium, and vanadium, is one of the sources of the Indian weavers' black dye, says Dr. Daniel T. O'Connell, geologist of the College of the City of New York. (*Science*, Sept. 22)

Navajos roast yellow carnotite powder in a frying pan until it turns black, then mix with pitch roasted to powder. A third ingredient is a brew from the entire plant of the squaw-berry bush, which must be boiled to a tea-color. The dye is diluted with water.

A good many Navajo weavers now use coal tar dyes, Dr. O'Connell says. But some of the better modern rugs are dyed with the old-time natural dyes, which the Indians themselves concoct from local plant and mineral sources.

Science News Letter, January 13, 1940

PSYCHOLOGY

Sleep Quality Important For Good Spirits Next Day

YOU must sleep well if you are to be in high spirits the next day, Dr. Weston A. Bousfield, of the University of Connecticut, told the meeting of the American Association for the Advancement of Science in Columbus.

Quality as well as quantity of sleep is important in producing that sense of well-being known to psychologists as "euphoria," Dr. Bousfield has found. If you get six to six and three-quarters hours of slumber of high quality, you will have higher euphoria than if you had the recommended eight or even eight and three-quarter hours of low quality sleep.

Although Dr. Bousfield did not mention it, his results suggest that sleep disturbed by worry of air raid alarms or by a bad conscience does not lead to gay spirits on the morning after.

Science News Letter, January 13, 1940

IN SCIENCE

PHYSIOLOGY

"Pep Pills" Fight Sleep Through Brain Respiration

SO-CALLED "pep pills" of benzedrine, resorted to, sometimes dangerously, by college students for wakefulness during cramming sessions, owe their sleepfighting effect to their influence on brain respiration, Drs. P. J. G. Mann and J. H. Quastel, of Cardiff City Mental Hospital, report. (*Nature*, Dec. 2.)

Benzedrine has "unquestioned value," the Cardiff doctors point out, in the treatment of narcolepsy, that strange condition in which the patient is seized, often at inconvenient and even dangerous times, with an uncontrollable desire to sleep. The condition is also known as paroxysmal sleep or sleep epilepsy.

Chemical studies by the Cardiff scientists suggest that benzedrine may fight this condition by retarding the formation of poisonous substances such as aldehydes which depress the respiration or oxygen uptake of the brain. Benzedrine does retard aldehyde formation, Drs. Mann and Quastel found. The next step will be to determine whether these or similar substances accumulate in the brains of patients with narcolepsy.

The Cardiff studies were made on brain tissue outside the body to which a chemical called tyramine was added. Tyramine and most other chemicals belonging to the amine group greatly diminish brain respiration or oxygen uptake. When benzedrine is added, this effect is neutralized.

Slowing of brain respiration is not so much due to the presence of tyramine itself as to accumulation of aldehyde. This chemical, highly poisonous to respiratory processes in the brain, is formed from tyramine or other amines by the action of an enzyme. Benzedrine also combines with this enzyme, but no aldehyde is formed from this combination. In the competition with benzedrine for the enzyme, tyramine comes off second best, the Cardiff studies showed, with the result that aldehyde formation is checked, and there is no slowing of brain tissue respiration.

Science News Letter, January 13, 1940

THE FIELDS

ZOOLOGY

"Highest-Up" Rodents Brought Back from Andes

"HIGHEST-UP" among the world's rats and mice are specimens collected above the 15,000-foot level in the Andes by the Magellanic Expedition of the Field Museum, just returned. One species is a chocolate-red mouse, another a somewhat larger rodent called locally "rata Andina." The expedition collected something over 2300 specimens of the principal animal groups, many of them representing evolutionary adaptations to high-altitude life.

Science News Letter, January 13, 1940

PUBLIC HEALTH

Influenza Increases, Hint of Coming Epidemic

HINT of a coming epidemic of influenza appears in reports to the U. S. Public Health Service, although incomplete reports for the last week in December, latest available, showed a drop in the number of cases.

The number of cases has been steadily increasing ever since October and during December ran from 1,000 to 5,000 cases higher per week than during the five-year median for the same period. For the week ending Dec. 30 there were 4,836 cases reported, but two states, among them South Carolina which has had the highest figures, have not yet reported. The week of Dec. 16, there were 6,455 cases reported throughout the nation, 2,353 of them in South Carolina. The number fell during the week of Dec. 23, and dropped still lower during the week of Dec. 30, but incomplete reporting during the holidays may account for this drop in reported cases.

For the week ending Dec. 30, public health statisticians expected an increase of 25% over the previous week. Unless South Carolina reports a new high figure, this expectation will not be fulfilled. While this seems encouraging, the "steady but not alarming" increase during the winter suggests that an epidemic may nevertheless be on the way.

Two states besides South Carolina have had more than their share of influenza, the reports show. Alabama reported 1,298

cases for the week ending Dec. 30, and Utah reported 964. These figures are considered high in relation to the small population of the states.

Science News Letter, January 13, 1940

BOTANY

"Plant Architect" Asks Aid From Chemistry

WANTED: More help from chemistry.

This notice is inserted in the *American Journal of Botany* by the man who has lately been doing most toward a chemical control over the evolutionary process in plants, and hence toward a new revolution in practical plant breeding, Dr. Albert F. Blakeslee, of the Cold Spring Harbor, N. Y., laboratories of the Carnegie Institution of Washington.

Dr. Blakeslee's outstanding contribution has been the use of the old-time rheumatism remedy, colchicine, to force a doubling up of the number of the heredity-bearing chromosomes in the cells of plants. This makes possible the juggling of genetic characters in ways not hitherto possible.

But Dr. Blakeslee is not content. If chromosome numbers could be permanently halved instead of doubled, still other moves could be made in the fascinating Mendelian chess game. Some of his friends have been trying to accomplish this by chemical means, but thus far have not succeeded. So that is Want Number One on Dr. Blakeslee's list.

Another wish which he puts up to a possible chemical fairy godmother is for some means to make shoots, bearing leaves and flowers, spring from any part of a plant—from stem, root or leaf. Chemical means have been found for making roots appear on stems, leaves and even flowers, but thus far only roots can be thus evoked. Shoots still evade the search.

Now, shoots are what the geneticist desires above all else, for flowers appear only on shoots, and only from flowers can the hybrid seeds be obtained that unfold the calculated magic of the chromosome-juggler. If one could only touch a chemical wand to a patch of blossomless tissue that gives genetic promise, and cause flowers to spring forth!

Other wishes uttered by Dr. Blakeslee are for chemical means for invigorating the offspring of wide crosses, often too feeble to survive, and even to break down the resistance to crossing between plants whose hybrid offspring he would like to see but for which he has never been able to arrange a successful match.

Science News Letter, January 13, 1940

MEDICINE

Slowed Down Neutrons Are More Effective for Cancer

SLOW neutrons from the atom-smash cyclotron, of the kind used in the spectacular splitting of the uranium atom, are five times as effective against cancer as the fast neutrons which are already showing promise as anti-cancer weapons, it was announced at the University of California.

The new, slow-neutron attack on cancer is far from the stage of being used in treatment of human cancer sufferers. It was developed in test-tube experiments with cancer tissue removed from the body by Dr. P. G. Kruger, of the University of Illinois, working with the University of California's cyclotron.

In the new process, fast neutrons coming from the cyclotron are slowed down by passing through a thick block of paraffin. These slow neutrons then enter a test-tube containing cancer cells in a solution of boric acid. The boron atoms of the boric acid capture neutrons which break down the boron into helium and lithium. These fly off and lose their energy in the malignant or cancer tissue and in so doing, destroy its malignancy.

It is possible that the effectiveness of boric acid lies in the very large capture cross section of boron atoms for slow neutrons. This has been demonstrated many times and, in fact, hollow cylinders of boron are used to produce collimated beams of slow neutrons. Only neutrons going through the hole pass through. The others are captured and stopped by the boron atoms.

Science News Letter, January 13, 1940

BOTANY

Plants Absorb Hydrogen; Use It in Life Processes

HYDROGEN absorption by plants, something never before observed, was reported by Dr. H. Gaffron of the University of Chicago. The plants able to perform this unique feat are one-celled algae, known to botanists as *Scenedesmus*. Kept in an atmosphere of hydrogen in the dark, they absorb the gas and use it in various ways in their life processes. In dim light, they combine hydrogen with carbon dioxide to form food materials. However, if the light becomes too strong, they stop absorbing hydrogen and return to the normal process of combining carbon dioxide with water, giving off oxygen as a by-product.

Science News Letter, January 13, 1940

PSYCHIATRY

Possible Cure Hinted For Nervous Breakdown

A METHOD of curing nervous breakdowns in rats, that may contain a hint of useful methods for treating human mental trouble, was reported to the American Association for the Advancement of Science in Columbus by Dr. Norman R. F. Maier, University of Michigan psychologist who last year won the thousand-dollar AAAS prize for merely producing nervous breakdowns experimentally in rats.

The trick in Dr. Maier's cure for neurotic rats is to encourage them to find something to do even though it fails to solve the conflict that confronts them. He calls this "abortive behavior." Rats forced to act in a manner which they have learned is wrong suffer nervous disorder. Dr. Maier, to cure them, trained them to just make a halfway jump toward solving their dilemma.

Translated into human applications, this is the way Dr. Maier's new therapeutics, at present tried intensively only on two rats, might work out:

A man driven by hunger of his children to steal bread but prevented by honesty might have a nervous breakdown. If he makes a clumsy and unsuccessful attempt to steal, his mind would be restored.

A girl urged by her parents to marry might dislike both of two available suitors. Forced to marry, she would break down. If she engages herself to one but is cold to him, so that they drift apart, she is saved. A substitute activity, such as a career of nursing, would serve the same purpose.

Occupational therapy in a mental hospital serves to fill this need for substitute or partial activity.

Science News Letter, January 13, 1940

ENGINEERING

Static Electricity Used For Industrial Separation

STATIC electricity, the kind that makes your hair stand on end when you comb it, is now being used by the food industry for the dry separation of particles.

Shelled nut meats can be separated from the shells. Raisins can be stripped from leaves and stem material. Watercress seed can be removed from rice, and pest seeds separated from various economic seeds. O. C. Ralston and Foster Fraas of the U. S. Bureau of Mines told the Chemical Engineering Symposium of the American Chemical Society at the University of Michigan.

Electrostatic separation—making use of the different behavior of dissimilar particles under the influence of an electric field—has long been used for mineral separation, said the Bureau of Mines scientists. To a large degree it has been superseded in this field, however, by flotation methods. In contrast, the food industries, where a dry separation is needed, use it widely and it is constantly being improved.

This progress, in turn, indicates possi-

bilities of applications in mineral separation by the electrostatic method. One new advance, said scientists Ralston and Fraas, is to pre-condition the surface of the mineral to be separated so that the particles can be more easily drawn apart in the electric fields. Acidic gases, such as hydrofluoric, have been found effective for silicate minerals. Feldspar and quartz can be separated by this method. The hydrofluoric acid forms potassium and aluminum fluorides on the feldspar particles, whereas the quartz particles are merely etched by the treatment and silicon tetrafluoride vapor passes off.

For separation of minerals like limestone, dolomite, magnesite and borax vapors of acetic and benzoic acids have been used for the pre-conditioning treatment.

Science News Letter, January 13, 1940

Flotation Purifies Cement

NEW WAYS of removing contaminating minerals from the limestone that is to be used for cement were de-

scribed by George K. Engelhart of the Valley Forge Cement Company, Catasauqua, Pa. Fatty acids are used to remove tiny grains of quartz from the limestone by an inverse flotation process; that is, the calcite—source of the lime—is floated off and the quartz dust left behind.

On the same program Prof. C. C. De Witt of Michigan College of Mining and Technology explained that nearly two-thirds of all the non-ferrous metal ores produced in the United States are concentrated by some variation of the flotation method. Citing figures for 1935, Prof. De Witt said that of the 49,000,000 tons of non-ferrous metal ores produced 34,000,000 tons were concentrated by flotation.

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Separation by Adsorption

JOHN W. Hassler of the West Virginia Pulp and Paper Company, New York City, described how adsorption can be employed to remove contaminations from solutions. Adsorption is the ability of solid materials to attract other materials to their surfaces.

Fuller's earth and activated carbon, Mr. Hassler said, are two of the best adsorbers. A handful of the latter has a total interior and exterior surface equal to an acre.

In some cases, he declared, adsorbers help to remove "negative catalysts." "We think of catalysts ordinarily as being something which helps speed up a chemical reaction," he explained. There are cases, however, where materials are present which slow down the chemical reaction and it is sometimes necessary to remove these negative catalysts before the reaction can occur.

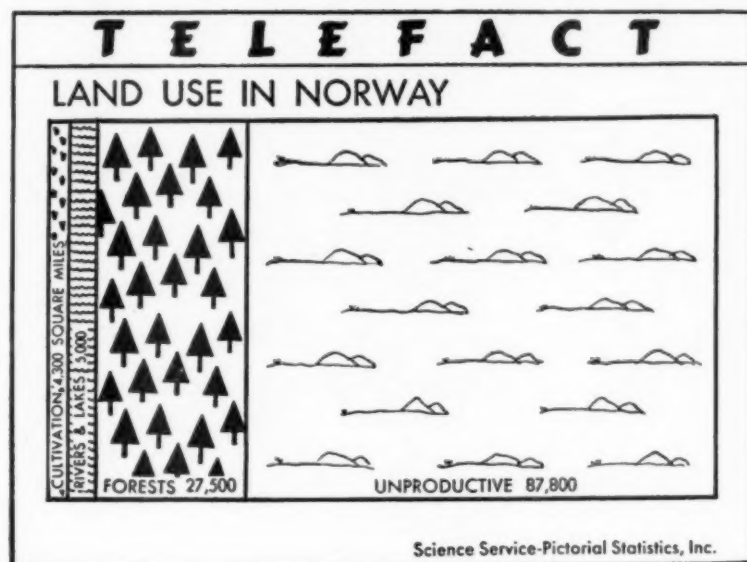
Mr. Hassler cited the recovery of iodine from oil well salt water as a splendid example of the separation of valuable material by activated carbon. A single installation on the West Coast for several years supplied one-third of the nation's needs of iodine by this method. It is available for similar production at any time and would be especially valuable in case of war.

Science News Letter, January 13, 1940

● RADIO

Karl P. Schmidt, curator of reptiles at the Field Museum of Natural History will tell about recent discoveries of new crocodiles as guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, January 18, 4:15 p.m., EST, 3:15 CST, 2:15 MST, 1:15 PST.

Listen in on your local station. Listen in each Thursday.



GENERAL SCIENCE

Poets Inspired Discoveries, Particularly Aviation

**And Science Stimulates Imagination, Says Dean Nicolson;
Huxley Visions an After-the-War World in Unity**

POETS and prose writers anticipated and inspired men of science to make some of their most important discoveries, particularly in the field of aviation, Dean Marjorie Nicolson of Smith College declared in delivering the annual Phi Beta Kappa address in connection with the meeting of the American Association for the Advancement of Science at Columbus.

"Imagination anticipated for hundreds of years the possibility of flight, before science did anything about it," Dean Nicolson declared. "The new interest in aviation which finally resulted in the invention of the heavier-than-air machine developed, not as a separate chapter in the history of science, but under the stimulus of astronomy."

"It has not been pointed out that the real reason for the stimulation of interest in aviation in the seventeenth and eighteenth centuries was the desire of men to find a means of flying to the moon. This theme is tied up with the long tradition of a belief in the inhabitation of other worlds. The excitement which was occasioned by Orson Welles' broadcast in 1938 on this same theme indicated

how vital the theme is in human imagination."

Dean Nicolson's researches upon the interrelations of science and literature refute the common point of view that science has had an adverse effect upon literary imagination. She expressed disagreement with the idea that science has cramped imagination. The people who hold this point of view, she explained, seem to feel that the fields of the sciences and the fields of the humanities have grown so far apart that there is little relation between them.

"Exactly the opposite has been true," Dean Nicolson said. "In the period in which modern science emerged, 300 years ago, there was an immediate effect upon literary imagination. In the science of astronomy, the work of Galileo in 1610 awakened an immediate response in poets and prose writers. Telescopic observations had an effect upon a number of major poets, including Milton. Some phases of microbiology had similar influence, producing the same immediate response in literary imagination among many popular writers, including Swift in 'Gulliver's Travels'. In many other

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instances, men of letters reflected in their work the stimulus of new scientific ideas."

Science News Letter, January 13, 1940

"Blueprint for After War"

A POST-WAR world from which mammoth armed nations shall have disappeared like the over-muscled, under-brained dinosaurs of old was forevisioned by Dr. Julian Huxley, noted English zoologist and grandson of the great friend and champion of Darwin. Dr. Huxley, who is secretary of the London Zoological Society, spoke on an exchange arrangement known as the British and American Association Lectures.

After the war, change is inevitable, the speaker declared, and he insisted that stubbornly conservative resistance is "not only useless but immoral." Nevertheless, change cannot come as quickly as some impatient men may demand:

"The zeal of the revolutionary for getting rid of the old system root and branch is thus likely to be wastefully destructive and in the long run to delay progress."

However, although the great power-states must go like the dinosaurs, a development of small, flexible nations like the mammals that followed the dinosaurs was not foreseen by Dr. Huxley. Such particularism is precluded by the complexly integrated state of human society all over the world. He visioned a federal system for world peoples, beginning probably on the basis of great regions but aiming eventually at complete world unity.

Throughout, Dr. Huxley cautioned against haste. He does not believe that Europe, for example, is yet ready for as close a union as that of the United States, but he does feel that something closer than the present League of Nations organization is essential. He pic-

tured a League having its own administrative set-up, its own budget, its own armed forces, and especially an organiza-

tion for the promotion and application of scientific research.

Science News Letter, January 13, 1940

PHYSICS

Water Obtained Solidified In The Form of Glass

Thin Stream Passed Between Metal Disks Chilled To Liquid Air Temperature in Novel Experiment

WATER solidified in the form of glass was described by Dr. B. J. Luyet of St. Louis University before the American Association for the Advancement of Science in Columbus.

Dr. Luyet passed a thin stream of water from a pipette between two metal disks chilled to liquid air temperature. One disk was fastened behind the stream and the other disk was driven against the stream by the spring of a toy pistol. Thin layers of solid water were thus obtained. When removed to a Nicol analyzing microscope apparatus using polarized light, the frozen films stayed dark between crossed Nicols until the stage of devitrification occurred as the temperature rose.

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heated it, and then stirred the powder in water or oil.

Held in suspension, the magnetic rouge particles have at first a random sort of orientation. If a small hand magnet is brought near the container, however, the little rouge magnets line up. If their long axis is at right angles to a beam of light, the intensity of the light will be greatly diminished. If the hand magnet is moved so that it orients the rouge magnets parallel to the light beam, the light transmission is increased. Prof. Heaps was thus able to make a light shutter which can be controlled by the strength of the magnetic field.

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From Page 23

Thin Films on Lenses

THIN FILMS of evaporated metallic fluoride on an f:2 camera lens increase the speed of the very fast lens by a factor of two, Dr. C. Hawley Cartwright of Massachusetts Institute of Technology told the physicists.

At the same time, he said, the troublesome "ghost" images which occur under adverse lighting conditions disappeared.

The increase in lens speed is rather subjective, he pointed out, for the added transmission of the lens is accompanied also by more contrast and by an observable increase in detail in the picture.

Science News Letter, January 13, 1940

Rouge Becomes Shutter

MOST remote from Milady's thoughts as she applies rouge to her face is the experiment reported to the meeting of the American Physical Society in which rouge is heated to increase its ferromagnetism and then used as a shutter to govern intensity of a beam of light.

Prof C. W. Heaps of the Rice Institute, Houston, Texas, took ordinary rouge,

Although the work was done on a low animal form, it represents, Dr. Welsh said, a definite step toward explaining the causes and nature of human sleep, one of science's major mysteries.

Nervous activity, gland secretions and general metabolism are interlocked in a complex chain of events to cause the daily color or pigment changes in the eye of the crayfish, Dr. Welsh found. This daily color change is a typical daily internal animal rhythm.

Many studies of persisting 24-hour animal rhythms have been made previously but this research on the crayfish has provided the first satisfactory experimental evidence of a complete internal series of events capable of keeping such a cycle in operation.

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Snakes Have "Ersatz" Eyes

THE EYE of a snake is an "ersatz" organ, declared Dr. Gordon L. Walls of the Wayne University College of Medicine, speaking before the American Society of Zoologists. Snakes are known to have evolved from lizard ancestors, and

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they have many features in common with lizards, yet their eyes are so little like those of their reptilian kindred "that no one would suspect, from the eyes alone, that a snake is any more closely related to a lizard than a cat is to a frog."

To account for this discrepancy, Dr. Walls suggested that the remote ancestors of snakes were once subterranean creatures, living in total darkness, until their eyes degenerated almost to the vanishing point, like the eyes of many cave animals now living.

"Later, the snakes emerged above ground and fought their way back to 'respectability,'" Dr. Walls explained. "To help accomplish this, they had to invent one substitute after another within the eye, to take the place of lost lizard-eye features. The fact that the snake eye is such a bunch of 'Ersätze' thus sheds light, for the first time, upon the habits and history of the first serpents."

Science News Letter, January 13, 1940

Rust Resistant Pines

YOUNG white pines that are apparently resistant to the deadly blister rust disease that is sweeping the country have been found in Wisconsin, it was reported by Prof. A. J. Riker of the University of Wisconsin and T. F. Kouba of the U. S. Department of Agriculture.

The tree plague had swept through an unprotected area in Wisconsin, killing practically all young white pines. However, perhaps one out of 300 to 500 trees survived, free from infection. A search was made for cone-bearing specimens for possible use in propagation, and 163 such trees were found. They have been exposed to blister rust constantly for 15 or 20 years, and it seems reasonable to suppose that some of them may be rust resistant, and therefore the potential ancestors of new white pine forests for the northern states.

Science News Letter, January 13, 1940

Lime Cements Cells

CELLS lining the capillaries, the ultimate fine blood vessels of the body, depend on lime to stick together, no less than the bricks of a house. Prof. Robert Chambers and Dr. B. W. Zweifach of New York University told how they had tried out blood vessels from a frog, using synthetic blood-like fluids, one containing calcium, the other without that element. When the calcium-free fluid was used the lining cells lost their grip on each other and the capillaries became "leaky."

Science News Letter, January 13, 1940

MEDICINE

Crystals From Soil Bacilli Protect Against Pneumonia

Material So Powerful That Millionth of an Ounce Protects Mouse Against Infection Otherwise Lethal

PNEUMONIA protection by crystals of a chemical obtained from germs that prey on other germs was announced by Drs. René J. Dubos and Rollin D. Hotchkiss, of the Hospital of the Rockefeller Institute for Medical Research, New York, at the meeting of the Society of American Bacteriologists in New Haven.

So far, only mice have been given the new germ-killing crystals. Studies on other animals and other disease-causing germs besides the pneumococcus are under way but have not yet been completed. The material described is so powerful that one-millionth of an ounce is sufficient to protect a mouse from a pneumonia infection which would otherwise rapidly kill the mouse.

Another chemical compound was obtained in pure crystalline form from the same germ source, but this second compound is ineffective in mice. Studies of the chemical differences between the two compounds will, it is hoped, help to explain what is necessary to secure a protective action against infection within the body of the animal.

Discovery of the potent germ-killing and apparently curative material was the result of a deliberate search in which the Rockefeller scientists took advantage of the fact that certain species of microorganisms or germs are known to be antagonistic to other species of microorganisms.

Staphylococci, commonly found in boils, abscesses and flesh wounds, were the bacteria chosen as the prey. Bacilli able to live upon them were found in soil. When grown in artificial media free from other bacteria, the bacilli still retain the ability to kill staphylococci and grow and multiply in their presence. Furthermore the bacilli were found able to kill not only the one species, but also a large group of organisms having in common with staphylococci the property of being "Gram-positive" (meaning that they are dyed in a particular way by a much-used bacteriological stain). Some other Gram-positive bacteria which are also susceptible are streptococci, pneumococci, and diphtheria bacilli.

From the bactericidal organisms was obtained a non-living chemical agent which by itself was able to kill the Gram-positive microbes. This chemical agent has now been further purified and two pure crystalline chemical compounds have been isolated from it. Both of these bactericidal compounds are so active that a millionth of an ounce is sufficient to kill a few billion pneumococci in the test tube.

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BOTANY

Tree Rings Fallible As Records of Weather

TREE RINGS are not infallible records of the weather in the years when they were formed. It depends partly on the species of the tree. Such would seem to be the inference from records before the meeting of the Ecological Society of America by Prof. Charles J. Lyon of Dartmouth College.

Prof. Lyon's studies were made on a number of trees, of six different species, that had grown for years in the near neighborhood of a regularly maintained set of weather-recording instruments. The 1938 hurricane blew them all down, which gave occasion for the study of correlation between their growth rings and past weather records.

Closest correlations between spring rainfall and ring growth was shown by white pine, Scotch pine and red oak, but

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Austrian pine, Norway spruce and European larch showed no consistent agreement with precipitation records of any period. Temperature studies showed almost no correlation whatever when the growing season itself was concerned, but all the coniferous trees gave significant correlations between growth rate and the temperatures in March and April, before the growth starts. This Prof. Lyon interpreted as an effect of water supply, too, since the air temperature determines

soil thawing and hence availability of soil moisture.

"On the whole," the speaker concluded, "our native white pine tree is particularly sensitive to its water supply and was the best indicator tree of those tested in this study. The width of its annual rings is a better index of growing conditions for crops and forests than the Weather Bureau records of rainfall and temperature for the year."

Science News Letter, January 13, 1940

ARCHAEOLOGY

Propaganda Served Egypt Four Thousand Years Ago

Pharaoh Ramses Spread His "Victory of Kadesh" Over Walls Quarter of Mile Long; Follower Used Same Piece

HISTORIANS, grown skeptical over modern nations' twisting and coloring of war news, have turned a sharp eye on Egypt's Pharaohs and found them adept at the best tricks of propaganda.

Evidence that Egypt began conscious use of propaganda as early as 2000 B. C. and that its historic inscriptions include actual defeats cleverly advertised as comfortable victories was reported to the American Historical Association Meeting at Washington by Dr. John A. Wilson, director of the University of Chicago's Oriental Institute.

Modern dictator governments would understand Pharaoh Ramses the Second's idea in spreading his "Victory of Kadesh" over walls a quarter of a mile in extent in the city of Thebes alone.

"It was a tremendous personal boast to overwhelm the rumor of failure," said Dr. Wilson.

Actually, Ramses did not win this mighty thirteenth century B. C. battle on the Orontes River in Asia Minor

against Hittites and their allies. Checked with other historic evidence, the best that can be said for Ramses, said Dr. Wilson, is that he fought a drawn battle and managed to retreat in good order.

Ramses' distorted war report evidently was successful propaganda, the Egyptologist added, since a century later Pharaoh Ramses the Third plagiarized almost word for word one of Ramses the Second's inscriptions, thereby claiming that he defeated a Hittite army almost single-handed at Kadesh. The third Ramses never fought any such battle at all, it is now pretty certain.

Success of old Egyptian propaganda is attributed by Dr. Wilson to efforts of the priesthood. Religion and state were inextricably mixed in Egypt. It was highly advantageous to the priests to give the ruler of Egypt a build-up as superhero, since this spurred Egypt on to glories and victories and in turn brought riches into temple treasuries.

Dr. Wilson expressed the view that

the world's growing skepticism, shown today in American newspapers' non-committal attitude in presenting war news, may lead to similar analysis of historical source records, and similar incredulity there. Egyptologists, he said, are already re-examining Egyptian texts, questioning whether they should be taken at face value.

Emphasizing that this does not mean tearing down ancient history, Dr. Wilson said:

"The analysis which gives an initial appearance of destroying history and historical figures may go on to rehabilitate both."

Science News Letter, January 13, 1940

GENERAL SCIENCE

Rule of Emotionalism Brings Law of Jungle

NEVER since 1600 has the world seen such a reversion toward authoritarianism, superstition and every irrational and unscientific brand of emotionalism as at the present moment. This is the judgment of Dr. Robert Andrews Millikan, Nobelist, expressed in his latest book, "Cosmic Rays" (Macmillan).

"Wherever emotionalism determines conduct, there you have necessarily the law of the jungle," Dr. Millikan writes.

His definition of a reactionary: "The man who has turned his face back toward the method of the jungle, toward brute government instead of ballot government, toward authoritarianism instead of toward freedom."

On the right and the left Dr. Millikan finds all the reactionaries, only in the center is found the true progressive. In the center, "are found all those who are trying to replace the method of the brute by the method of a being supposed to be endowed with a mind—that is, by analysis, by persuasion, by adjudication, by compromise, by evolution, by peaceful change. On the left, and in somewhat lesser number on the right, are found all those who, no matter to what kind of liberalism they may pretend to adhere, actually support by their influence, and practise in varying degree, violent world revolution, assassination and intimidation, suppression of freedom of speech, press and action, indoctrination of the public in the interests of the ideas and the individuals at the moment in power, despotism—in a single word, reaction."

Science News Letter, January 13, 1940

About 18% of accidents at home occur in the kitchen, result of hurry usually, or using makeshift tools.

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A Good Word For Rats

RATS, like the Devil, are given their due in the new U. S. Department of Agriculture yearbook. These despised and hunted intruders in man's house are put to extensive use in at least one phase of man's service, it is pointed out.

One reason why rats have been so successful (from their own point of view) as man's uninvited house-guests is that their appetites and physiology are so much like our own. Hence it is possible to use them as living test tubes to assay the value of foods intended for human consumption. No modern nutrition laboratory is complete without its colony of thousands of caged rats.

Other animals are available as food testers, of course: "Try it on the dog" is proverbial procedure with appetizing-looking but suspicious novel foods. But dogs are expensive, and even guinea pigs and rabbits are underbid by white rats.

"The rat is small and handy," the Yearbook points out. "Several hundred of the animals can be kept in comfort in a space the size of an ordinary living room. A rat can be fed for 50 cents a year as compared with \$4.50 for a rabbit, \$15 for a dog, \$75 for a dairy cow, and \$400 for an elephant."

"Just as important as economy is the fact that the rat lives very fast. Its life span is two to three years, so that one year is equivalent to 20 or 30 years in the life of a human being. It is possible to carry on an experiment with rats that will cover not only one generation but many successive generations."

Science News Letter, January 13, 1940

Wild swine in the New York Zoo demonstrated the plowing power of a pig's snout when they thoroughly tore up a macadam road.

MEDICINE

Synthetic Female Hormone Pills Considered Potential Danger

PILLS of synthetic sex hormone which the woman over 45, and sometimes a younger woman, can swallow to get relief from distressing symptoms of glandular failure are effective but potentially dangerous.

This verdict is announced by the American Medical Association together with a statement from its council on pharmacy and chemistry that the new product "should not be recognized for general use or for inclusion in New and Non-official Remedies at the present time." (*Journal, American Medical Association*, Dec. 23)

Liver damage and cancer are among the possible dangers seen in use of the new synthetic hormone. The medical profession in general is advised not to use it until further studies have been made by experts.

Stilbestrol is the name of the new product. It was synthesized by a group of English scientists, Drs. E. C. Dodds, L. Golberg, W. Lawson and R. Robinson. While its effect on the body is like that of one of the female sex gland hormones, its chemical composition is quite different.

Important advantage of stilbestrol over the natural hormone, besides its lower cost, is that it can be given by mouth without any loss of potency. Other sex gland products are usually given by hypodermic injection, to give an effective amount at least expense. This one can be given either in pills or in doses of oil.

The headaches, depression and hot flashes which are distressing symptoms experienced by most women over 45 years have in some cases been completely relieved by stilbestrol. The new synthetic hormone has also been given with success to a few young women whom nature had partially cheated of their womanhood.

Success with the use of stilbestrol in women suffering from sex gland failure is reported to the American Medical Association by three groups of physicians, but two of the groups warn of its possible dangers.

Toxic symptoms, including nausea, vomiting, abdominal distress, loss of appetite, lassitude, skin rashes and even

mental disorder, occurred in 35 out of 44 women treated by Drs. Ephraim Shorr, Frank H. Robinson and George N. Papanicolaou, of New York City. Tests showing that stilbestrol might cause liver damage are also reported by this group, though they state that more studies must be made to clarify this point.

No such toxic effects were noted by Drs. C. L. Buxton and Earl T. Engle, of New York City, following treatment of 17 patients, all but two of whom were helped by the treatment. Sex hormone treatment of women with cancer in the family, however, should be given cautiously, these doctors warn, whether natural or synthetic hormones are used, because these products have proved cancer-inducing in animals.

Good results with stilbestrol in treatment of 37 women without any sign of toxic effects are reported by Drs. Cyril H. MacBryde, Harold Freedman and Ellen Loeffel, of St. Louis.

Science News Letter, January 13, 1940

A paper museum at the Massachusetts Institute of Technology, recently opened, includes exhibits from all over the world.



GROW PRIZE-WINNERS CREATE UNHEARD OF PLANTS IN GARDEN - HOUSE - CLASSROOM

SOILLESS GARDENING (growing plants in chemicals) COLCHICINE (revolutionary chemical creates giant new unheard of plants and fruits, huge doubled and redoubled flowers) PHOTOSENSIN (makes plants vitally super-sensitive to light) VITAMIN B₁ (produces giant, prize-winning "MYSTERY" flowers) INSULATED GREENHOUSES (electric lamps only heating plant required, use less glass makes greenhouses available to many)—the above mentioned articles plus page after page of SCIENCE and MEDICINE—and—

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Engineering

A. T. & T., The Story of Industrial Conquest—N. R. Danielian—*Vanguard*, 460 p., \$3.75.

AMERICAN TEL & TEL, The Story of a Great Monopoly—Horace Coon—*Longmans, Green*, 276 p., \$3.

Two books dealing with the Nation's telephone system, written from somewhat different viewpoints. Epitomized by Mr. Coon's first sentence "The monopoly question is now squarely before the American people" and Mr. Danielian's opening "This book attempts a case study of certain generic forces in the stream of current history . . . The great Bell Telephone System is treated as an historical laboratory . . ."

Science News Letter, January 13, 1940

General Science

A SHORT HISTORY OF SCIENCE (Rev. ed.)—W. T. Sedgwick and H. W. Tyler—*Macmillan*, 512 p., \$3.75. A rewriting of a well known work which will be useful for orientation of anyone interested in science whether student, practitioner or layman. The historical record does not extend much beyond the beginning of the twentieth century.

Science News Letter, January 13, 1940

Philosophy

PHILOSOPHIC ABSTRACTS—Dagobert D. Runes, ed.—*Pub. at 884 Riverside Drive, New York, N. Y.*, quarterly, \$4. per year. A new service to philosophy with signed abstracts, which take on the nature of miniature essays.

Science News Letter, January 13, 1940

General Science

SCIENCE IN YOUR LIFE—John Pfeiffer—*Macmillan*, 109 p., 60c. A little book touching in simple language the high spots of science and its applications.

Science News Letter, January 13, 1940

Economics—Politics

THE FUTURE IS OURS—Jay Franklin—*Modern Age*, 208 p., 50c. Persuasive literature for the continuance and preservation of the New Deal, particularly the TVA, written by a liberal Washington columnist.

Science News Letter, January 13, 1940

General Science

SCIENCE FOR THE WORLD OF TOMORROW—Gerald Wendt—*Norton*, 316 p., \$2.75. The director of science for the New York World's Fair tells the story of science as reflected in our everyday living. Setting

forth advances in the use of natural resources, in transportation, in communication, in housing, in food, in medicine and health, in clothing and synthetic materials, he also discusses the use of leisure and comes to the conclusion that scientific attitude is one of the most important contributions of science to the world.

Science News Letter, January 13, 1940

General Science—Juvenile

STORY PICTURES OF CLOTHING, SHELTER AND TOOLS—Jonathan Yale—*Beckley-Cardy*, 277 p., 92c. Good reading for eight to ten year olds in the school or out. Many grown ups don't know some of the things told.

Science News Letter, January 13, 1940

Exploration—Zoology

THE GREAT NATURALISTS EXPLORE SOUTH AMERICA—Paul Russell Cutright—*Macmillan*, 340 p., \$3.50. From Humboldt and Darwin to Fairchild and Dittmars, naturalists of all species have found a fascination about South America. Many great books have been written about that continent, still the least known of the world's great lands, but up to now there lacked a connected story about the men who loved and explored it. This need is now happily supplied in the first part of the present work. The rest is devoted to a comprehensive survey of the animals of the whole continent.

Science News Letter, January 13, 1940

Paleobotany

TEXTBOOK OF PALEOBOTANY—William C. Darrah—*Appleton-Century*, 441 p., \$6. A well-illustrated textbook, in a field that is even yet not too well supplied.

Science News Letter, January 13, 1940

Meteorology

EXPERIMENTAL STUDIES OF ANEMOMETERS—Sterling Price Ferguson—*Harvard Univ. Press*, 101 p., 90 c. A detailed technical study, of value principally to meteorologists.

Science News Letter, January 13, 1940

Botany

MISTLETOE AND HOLLY—Sophia Prior—*Field Museum of Natural History*, 30 p., 25c.

Science News Letter, January 13, 1940

Botany

PRINCIPAL DECAYS OF SOFTWOODS USED IN GREAT BRITAIN—K. St. G. Cartwright and W. P. K. Findlay—*British Library of Information*, 106 p., 16 pl. 75c.

Science News Letter, January 13, 1940

Economics—History

INTERNATIONAL SECURITY—Eduard Benes, Arthur Feiler and Rushton Coulborn—*Univ. of Chicago Press*, 153 p., \$2. The former president of Czechoslovakia and two other authorities on international affairs discuss the world and some of its problems as they were viewed before the present war.

Science News Letter, January 13, 1940

General Science

THE ADVANCEMENT OF SCIENCE: October, 1939—*British Association for the Advancement of Science, London*, 205 p., 5s. Partial report of the shortened meeting of the B.A.A.S. held just as the war began. Hereafter these reports will appear quarterly.

Science News Letter, January 13, 1940

General Science

EXCURSIONS IN SCIENCE—Neil B. Reynolds and Ellis L. Manning, eds.—*Whittlesey House*, 307 p., \$2.50. Thirty scientists present thirty-five stories of science, originally presented as radio talks over the General Electric station at Schenectady. The range is wide, from chemistry and physics to archaeology and astronomy.

Science News Letter, January 13, 1940

Psychology

THE FINE ART OF PROPAGANDA, A Study of Father Coughlin's Speeches—Alfred McClung Lee and Elizabeth Briant Lee, editors—*Harcourt, Brace*, 140 p., \$1.50. In this book prepared by the Institute for Propaganda Analysis, all the tricks of the propagandist nicknamed "name calling, glittering generality, transfer, testimonial, plain folks, card stacking, and band wagon" are illustrated by samples from the speeches of Father Coughlin.

Science News Letter, January 13, 1940

Psychology

THE SECRET OF CHILDHOOD—Maria Montessori—*Stokes*, 286 p., \$2.50. To those whose minds can travel back to the beginning of this century, the name Montessori is almost synonymous with early pre-school teaching of children. The book is intended for parents as well as teachers.

Science News Letter, January 13, 1940

Psychology

COMING OF AGE, A Frank Study of the Problems of Adolescence—E. Milton Grant—*Revell*, 91 p., \$1. A book by a pastor for the use of other ministers and leaders of youth.

Science News Letter, January 13, 1940